

A WORKMANSHIP OF RISK: THE CRAFTING OF THOUGHT IN AN AGE OF SPEED AND DISTRACTION

by Maggie Jackson

“How much can one fathom in a heartbeat or know deeply at a glance? In a culture smitten with technology, what does good thinking look like?” This question sets the stage as Maggie Jackson explores society’s relationship with devices and society’s use of technology. She examines ways in which multitasking has jeopardized our ability to think deeply. She then offers techniques to foster “slow thinking,” such as spacing out thinking and work and creating boundaries of time and space to spotlight thinking. While alarming, her message is hopeful. Recognizing the Montessori approach as part of the solution to encouraging concentration, freedom, and self-discipline, she poses its importance in a larger cultural context.

On a warm September evening in 1907, Freud stood on the Piazza Colonna in Rome, spellbound. He had long been enchanted with the ancient city, once comparing its archeological layers to the complexities of the mind. But that night, he was glimpsing the future. Along with hundreds of other onlookers, he was absorbed in a wondrous spectacle, a series of still ads interspersed with photographs and short films projected onto a screen in the Piazza. The cinematic loop repeated again and again, yet Freud could not pull

Maggie Jackson is an award-winning author and former Boston Globe columnist known for her penetrating coverage of social issues, especially technology’s impact on humanity. Her essays and articles have appeared in publications worldwide, including The New York Times, Business Week, Utne, and on National Public Radio. Her acclaimed book, Distracted: The Erosion of Attention and the Coming Dark Age, jumpstarted a global conversation on the steep costs of fragmenting our attention. A 2016 Bard Graduate Center Visiting Fellow, Jackson’s forthcoming book explores the craftsmanship of reflective thinking in an age of speed. She can be reached at www-maggie-jackson.com.

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himself away. "When I turn to go, I detect a certain tension in the attentive crowd which makes me look again," he wrote in a letter home later that evening, "and sure enough a new performance has begun, and so I stay on."¹ Consider the great thinker entranced by the precursors of the media that envelop us today. He was witness to a budding culture shift that would reshape the minds of young and old alike. Finally awakening from his automated reverie, feeling "too lonely in the crowd," he broke away. Others in the Piazza, he wrote, would stay as long as the spectacle lasted.

Now fast forward and imagine a twenty-first century child immersed in what Jonathan Crary calls the "overloaded field" of modern experience.² Children eight and under are exposed to nearly four hours of *background* television a day, beyond what they watch directly.³ Overall, nearly sixty percent of teens and forty percent of tweens are exposed to more than four hours of screen media a day, *not* including screen time in school or for homework.⁴ The median number of texts sent and received by children ages twelve to seventeen is sixty a day and some manage a torrent of hundreds.⁵ And who are their role models? Office workers switch tasks on average every three minutes, with half of such interruptions self-imposed, according to Gloria Mark, a leading researcher in the new science of interruption.⁶ Seventy percent of work emails are opened within six seconds; just being on email speeds up work and raises stress, studies show.⁷ Nearly seventy percent of adult smart phone owners sleep with the device no further than arm's reach, that is, in their bed, hand, or on a nightstand.⁸ We have come a long way from Freud's time on the Piazza Colonna. As his experience foretold, our lives are increasingly marked by speed, interruption and brevity. More than ever, we seem determined to stay as long as the spectacle lasts.

We live in a world where multitasking is considered a bragging right, and where children learn early on that answers, quick and neat, come from gleaming little boxes that mesmerize their parents. We live at a time when humans talk openly of a post-human age, and seem increasingly allergic to the hard work of deep focus. But how much can one fathom in a heartbeat or know deeply at a glance? In a culture smitten with technology, what does good thinking look like? Is the machine our resource, our cognitive prosthetic, our idol? These are crucial questions posed at a high-stakes moment in



humanity, and Montessori education, with its longtime emphasis on concentration, routine within freedom and normalization, should be at the frontlines of our search for answers. The very year that Freud visited Rome, Maria Montessori opened the *Casa dei Bambini* there, inaugurating a seismic counterpoint to the modern dislocation that he would experience on the Piazza. Today, we stand at a crossroads, cultivating an astonishing immersion in a new way of life and yet at the same time making nascent efforts to gain perspective on our choices. There is, we might say, a telling tension in the crowd. So let us probe the rhythms of our unease and enchantment, and work to better understand our culture of fragmentation and disconnection. Let us consider the gains and the risks of this new way of life and envision a way forward that builds upon intellectual skill and is attainable by all.

A TIME-SPlicing ERA

When I speak to parents, someone inevitably will ask, “Should I be worried that my child is multitasking through her homework?” For years, I could tell them only that this modern “skill” that the young have seemingly conquered, in fact, slows us down and leads to error.⁹ But now a more complete scientific picture of multitasking’s long-term costs has begun to emerge and the implications are, as

the late Stanford scientist Clifford Nass noted, “frightening.”¹⁰ For those who juggle most, do it least effectively. Moreover, they may be undermining crucial cognitive abilities, such as the capacity to sift, recall, and flexibly use new information over time.

Consider a seminal study that Nass published in 2009 that was inspired by his sheer amazement at the degree of media-born multitasking on campuses.¹¹ He and his colleagues wondered, What is the students’ secret, how do they juggle so well? First, they tested students on their ability to filter out irrelevant information by showing them two red rectangles flashed twice on a screen while surrounded by blue rectangles. The goal was to tell whether the red rectangles had shifted position. To the scientists’ surprise, chronic multitaskers, who juggle as a way of life, performed far more poorly than those who multitask judiciously. Constantly mesmerized by the blue rectangles, they were, as Nass noted, “suckers for irrelevancy,”¹² and severely prone to false alarms. In further experiments in Nass’ and other laboratories, high multitaskers proved inept at switching cognitive gears, which is the core act of multitasking, and also exhibited both poorer long-term and working memory, i.e., the crucial ability to hold information briefly in mind.¹³ The scope of their attention seems to be over-wide.¹⁴ In trying to drink in *all* data points, they become lost in thickets of minutia and trivia.

Certainly, a child who multitasks her way through her homework, as many now do, may ace a test, yet over time she likely will have an increasingly flimsy grasp of the material. As a result of her insufficient and imprecise memory stores, she will be less able to recognize a slightly different version of a math problem that she has studied. In a pinch, she will be less able to reach for the left field solution that marks agile thinking. Knowledge gleaned while multitasking is more fragile and inflexible.¹⁵ Yet perhaps what’s most astonishing about the risks of multitasking is that we are so blind to them. Most of us overestimate our ability to multitask; people who are on their laptop while watching television, for instance, estimate that they switch attention roughly twenty-four times an hour, ten times less than in reality.¹⁶ And those who multitask the most, are *least aware* of their shortcomings.¹⁷ (Just glance at your fellow drivers on the road.) Once upon a time, humans looked to cues of sun, season, and time-keeping to mark their days. Now we seek freedom

from the fetters of both biology and the clock, believing we can layer moments as our ticket to efficiency. In this heady time, duration is intolerable, the instant is all, and the first cost to our new way of life is a disregard for the *integrity of the moment*, the crucial starting point to thinking well.

What else is missing in a time-splicing world, when we traffic in morsels of knowledge that are lightly grasped and disconnected? *Verticality*, the building of thought. We often are prone to think of greatness as the product of quick wittedness or lightning strikes of the muse. Certainly, humans can achieve much at a glance, swiftly detecting patterns, anomalies, and contradictions. The veteran doctor diagnoses the disease from across the room. The chess master instantly knows the next move to make. Long experience gives experts a foundation for quick thinking, based upon recognizing the parallels of present situations to the past. But in truth, the inventions and discoveries that change the world must be painstakingly pursued and tenaciously constructed, with the best of intuitions and epiphanies acting as crucial data points. Lin-Manuel Miranda took six years to create the award-winning musical *Hamilton* and a full year to write just one of the play's songs, "My Shot."¹⁸ To discover the code of life, Francis Crick and James Watson collaborated for two solid years, arguing, daydreaming, contemplating, and guessing. (Emulating the giants in his field, Crick had spent his early career teaching himself "how to see problems, how not to be confused by the details.... Just as important as having ideas, is getting rid of them."¹⁹) When faced with a novel or muddy challenge, the best thinkers consciously *construct* thought. They move past a first, often flawed answer, they refine their thinking, and then step back and critique the work closely and as a whole. "What patience, what stubbornness are demanded of art," the sculptor Rodin once wrote. "If you are in a hurry... it is all over."²⁰ *Slow* thinking, the artistry of the reflective mind, gives us the ability to test and craft a nuanced solution. It is our most nimble state of mind.

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In the scientific domain, for instance, the foremost tool for knowledge-making is the framework. Far more than a simple hy-

pothesis, a framework—also called a *mental model*—serves as a crucial backdrop, foil, and yardstick with which to consider each unfolding piece of evidence. In the workspace of his focus, the perceptive thinker is integrating, ordering, *pulling together* multiple strands of knowledge to erect a budding structure of understanding. Novice scientists jump at the shadow of the unexpected in the laboratory, studies show. Mesmerized by the surprise findings that make up half or more of experimental results, they have not yet mastered working with what neuroscientists call the “controlled neglect” of facts. In contrast, world-class scientists tend to ignore, particularly at the beginning of an experimental journey, the one-off anomalies that are peripheral to their framework. They are shoring up the structure of understanding that will carry them toward discovery. Yet as they work to confirm their core viewpoint, they continually probe its essential fit with emergent reality, the source of its relevance.²¹ Crick, an ardent believer in the importance of the framework in science, called this mental tool a *plausible point of view*.²² Without it, he wrote, “one generally ends in the wilderness.”²³

Yet today, there are disturbing signs that adults and children alike are less able to master the crucial capacity of building knowledge. Americans, from school children to adults, show across-the-board declines in major measures of creativity, according to longitudinal research by Dr. K.H. Kim, a professor of innovation and creativity at The College of William & Mary.²⁴ Since the 1980s, but especially in recent years, we have become less able to see a problem from different angles, less able to synthesize information, less imaginative, and even less humorous! And the steepest drop among the six subscales of creativity testing concerns a cognitive capacity called *elaboration*. That is the ability to put flesh on an idea, cultivate a thought, and see a problem or question to its culmination—all skills related to what I call *verticality*, the building of effective thought.²⁵ Children and adults alike have shown a nearly forty percent drop in this skill from 1984 to 2008. What is under threat

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in this new age? The *integrity of the moment*, a protective space for comprehending a changing world, and *verticality*, a crucial process for constructing flexible, nuanced thought.

THINKING WITH EYES WIDE OPEN

Of course, we *want* information at our fingertips. I revel in the connectivity of my devices. I relish the ability to hurtle my body and thoughts around the globe. Still, I wonder, are we asking the right questions of our tools and of ourselves? We live in an age that is hopeful that a glance will suffice, that one tempo (fast) will speak to all our needs and that answers can be for the most part neat, easy, and downloadable. We live in a society that increasingly values all that is quick, automatic, and clear-cut: *the very definition of a machine*. Today, our children are growing up in a society where almost everything in life works against duration, meandering, discernment, focus, and reflection. As the Harvard professor Jennifer Roberts has noted, every external pressure, social and technological, is pushing younger generations toward “immediacy, rapidity and spontaneity.” Concerned, Roberts a few years ago decided that she had to “actively engineer” experiences of patience and focus for her students. She wanted to “give them the permission and structures to slow down.”²⁶ Roberts is an art historian, so to show her charges that discovery is not the work of an instant, she resolved to place at the center of her teaching a seemingly simple exercise: looking at an artwork for three solid hours. The experiment in naïve observation prefaces the students’ work on a major term paper. Before their book research begins, students simply observe with an open mind. For Roberts, the assignment has become her master lesson in learning to look beyond surface glimpses. Moreover, she is not alone: Similar assignments have been added to curricula at business and medical schools and even at the elementary level to boost critical thinking skills.²⁷ It is an experiment, I believe, that can speak to us all, giving clues to cultivating the integrity of the moment and to restoring verticality in thinking. When told of their homework, by the way, Roberts’ students are reluctant, fearful, even shocked. There is a “look of terror in their eyes,” Roberts told me. So I decided to try it for myself.

After a bit of wandering through New York’s Metropolitan Museum of Art, I chose Emanuel Leutze’s “Washington Crossing the

Delaware" for its iconic subject, mammoth size, and handy nearby bench. Sizing up the work at first seemed easy. In the 1851 painting, George Washington stands at the prow of a crowded rowboat, crossing the ice-strewn river hours before his pivotal Christmas 1776 victory in Trenton. We all know the story, the patriotic motif and the hero who inspired this famous image. What more could I possibly uncover? Like Roberts' students, I was all too ready to allow a glance and a guess to suffice. Fearing with a start that my experiment would fail, I began counting and categorizing the soldiers in the boat and their hats; their expressions of fear, anxiety and resolution; and the splashes of eye-catching red—the stripes of a flag, the watery reflection of a soldier's scarlet tunic—sprinkled across a canvas dominated by tones of earth, wood, ice, and sky. Beneath the surface of this icon, beyond the veneer of my conjecture, I sensed an elusive untold story. But how could I crack its code? A quarter-hour in, and I found myself longing for a peek at Google or at least the painting's label. "I've had enough," I wrote in my notebook. "I am craving answers." Visitors drifted by, and the guard sneaked a look at his phone. I changed benches to shift my perspective, battling to hold the painting in mind.

Then slowly, with each revisit of the canvas, the scattershot and spontaneous led to lines of possible reasoning and a deepening curiosity. I had noted the bursts of red across the work, but in time I began to wonder if they were harbingers of the blood to be shed in the battle to come. After twenty minutes, I saw subtler signs of tension: the chill emptiness of the approaching riverbank; the flag erect but furled; guns and bayonets held aloft, mute yet ready to do violence. This was not the stock portrait of wartime glory that I had expected. ("If you have not been surprised by your object in some way, you haven't looked hard enough," Roberts tells her students.) In eighty minutes, the painting's stillness and silence struck me. The boat inches forward, raising just a tiny splash at bow and oars. No one, not even Washington, speaks. I was entranced. The distractions of the room and day faded. My eye began to linger, not leap. I was gaining a foothold on the painting's hidden secrets, making connections from the piecework of conjecture. The process was no series of easy epiphanies. My notebook filled with backtrackings and potential irrelevancies. But when I seized the opportunity to think with eyes wide open, I began to sense a tale of anticipation,

of the moment before a perilous landing, a daunting battle, and a fateful turn of war for an untested country. In the time that I often spent racing past dozens of paintings, I had caught a glimmer not only of unseen worlds within the artwork, but within my conscious mind. Guesswork yielded to the artistry of reflection. “With the wreathed trellis of a working brain,” wrote the poet John Keats in his “Ode to Psyche,” “There shall be … all soft delight that shadowy thought can win.

THE CULTIVATION OF FOCUS: THE CRAFTING OF THOUGHT

What happened? First, I began to engage in *boundary-making*. For three hours, I preserved the integrity of the moment. And how I did chafe. Too often, boundaries are seen in our culture as confinement, as the absence of freedom. After all, the Industrial Age drew sharp divisions between home and work or men’s and women’s place in society, often in the name of efficiency. This was the age when bureaucracies, schools, and factories were invented to delineate and separate realms of human identity and purpose. And now we rebel, rightly reveling in a new world where physicality and virtuality collide and intersect, where identity can be changeable and work disconnected from time and place. Still, consider once again the gifts of boundary-making. A child’s curfew, a job description, the Industrial Age invention of the weekend: all are systems of prioritization, safety zones, and structures for the creation of depth. Most of all, focus is a form of boundary-making. It is, scientists like to say, the spotlight of the mind, one of three major forms of attention, along with awareness (sensitivity to our surroundings) and executive attention (the ability to plan and weigh conflicting data). Focus, or in scientific terms *orienting*, is with good reason the first attentional capacity that a baby develops. Unless a child can draw boundaries around what is important in each particular moment, they cannot progress to thinking deeply. Boundaries let us think creatively, keep us from being scattered, and protect the integrity of moment. If I had given in to my impatience and squandered the bounded workspace of my focus, I would still see the painting as a cliché.

How can we “actively engineer” attention and train the spotlight of the mind? Today, we need to create *environments* conducive to attention, as “bare walls theory” teaches us. In one famous experi-

ment, Carnegie Mellon University researchers gave a kindergarten class six introductory science lessons, half taught in a heavily decorated classroom and half in a less visually cluttered space. Later, the students scored nearly fifteen percent higher on tests of the material taught in the less visually distracting room. Importantly, they also spent far less time off-task in the “bare walls” classroom, compared to the highly decorated space (nearly thirty versus forty percent respectively).²⁸ At home, parents can take a step toward helping children boost focus by creating serene homework corners. Or teachers and parents can use the boundaries of the *clock* to support children’s capacity for focus, just as Montessori classrooms do with three-hour work cycles. In one experiment, students from middle school to college-age were able to boost their attentional capacity by taking a one-minute break from screen technology every quarter hour that they studied.²⁹ We need to use boundaries of time and space to help us set boundaries of the mind and prioritize what we are deeming worthy of our attention.

What else did my adventure teach me? In the workspace of my focus, I was trying out ideas, testing conjectures, and building the solid framework of an understanding. In the museum, I had begun to encounter the *craftsmanship of thinking*. I had begun not just to slow down to think, but to think slow. I discovered a forgotten side of myself. The quick, intuitive, largely unconscious mind is our first responder, offering instant answers that are often accurate yet incomplete, telling yet vague. Slow thinking, in contrast, is the product of the more recently evolved conscious mind. It allows us to parse a problem from all angles, elaborate a nascent idea, and weigh conflicting evidence. Slowness in the life of the mind allows for intellectual flexibility, and, moreover, it is the root of craftsmanship, the power behind the artisanal. Craftsmanship, after all, is antithetical to impulsivity and speed. The making of anything well—a pot, a law, a painting—entails a skilled, deliberative act of duration. And reflection, in turn, is at best a slow and *skillful* practice. Today, how can we recover our *verticality*, our depth of thought, in a distracted age? How can we counter our dangerous over-emphasis on automatic, instant, quick thinking? Discover thinking as craftsmanship. I see myriad possibilities and a new language for critical thought, when we explore the long-forgotten interplay between these two facets of human achievement. I envision craftsmanship as a way to



Courtesy of Pacific Crest School

skillfully approach a roster of different *types* of reflective thinking, from the elaborative awareness that I experienced at the museum to the art of skillful reverie and more. And I see Montessori education, with its emphasis on concentration, freedom, and self-discipline, as having an important role to play in this new approach to thinking. Becoming artisans of the mind can help us recover focus and reflection within and outside the classroom walls.

Consider creative daydreaming. When we let our minds drift judiciously, rather than wander aimlessly, we embark on a core practice of the artisan. I call it *sketchbook thinking*. To the maker, a sketchbook is a repository of plans, and yet also an intimate space for freewheeling possibilities, failed ideas, mental time travel and what scholars call *primi pensieri* or first thoughts. For centuries, Leonardo da Vinci was considered just a minor painter until the discovery of his notebooks, where he worked out his inventions, his engineering and theatrical designs, and his ideas for paintings. “Confused things rouse the mind to new inventions,” da Vinci once wrote.³⁰ The sketchbook allows the artisan to free herself from the

obvious, to let seemingly unrelated thoughts to converse with one another, as does the best daydreaming. Could we begin teaching children the craft of reverie? What if we spoke of creative reverie as a private, intimate space for testing life's possibilities and even as a crucial moment in the day? What if we set aside time to let the mind drift or guide our thoughts toward invention? Across all age groups, five minutes of daydreaming after learning boosts memory for new material twenty to thirty percent. (Intriguingly, this gain is realized in those who do *not* think consciously about the new learning.)³¹ After stressful situations, people who daydream of the future, not the past, grow calm.³² Those who let their minds drift during easy, but not difficult, tasks are more self-controlled on the whole.³³ Science has yet to decode all the mysteries of the daydream, yet we are beginning to understand that reverie is a soothing, strengthening practice, a space for play, invention and rehearsal, a cognitive endeavor that is indeed a gently crafted practice. The possibilities are exciting. When you engage in sketchbook thinking, you are respecting the integrity of the moment, and beginning to elaborate thought.

Or consider the *spacing effect*, the force of delay in learning. When we space out learning—over a week instead of one night, even over a period of years—we are allowing for the slow digestion of knowledge that multitasking sabotages. The effect has been proven in hundreds of studies over a century. Children who get reading lessons split across the day improve phonics skills dramatically.³⁴ Students who practice a tough math problem twice in a week score double when tested a month later than those who studied all in one go.³⁵ Part of the power of spacing, of course, stems from *consolidation*, the mind's unconscious efforts to weave new information into the schemas of our knowledge. But something even more intriguing occurs when we harness the power of delay: something reflective, discomfiting, and crafted. When we return to the material after a delay, we naturally must struggle to "get back into it," to, in scientific terms, "retrieve" our evolving knowledge. And this discomfiting process is in itself a crucial step in the making of knowledge. Recollection isn't a neat, machine-like downloading into consciousness, anymore than learning itself is rote replication. The more we work to retrieve a fact or concept after a delay, the more we are strengthening the vast schemas of our memory. In one series

of experiments, people memorized word pairs that are “weakly” associated, such as “mouse” and “hole” (not cheese) or “whale” and “mammal” (not ocean). Those who were given the first word in the pair and asked to guess its match, later proved twenty percent better at remembering the word pairs. In their always-futile quests to find the rare matching word-hole or mammal—they stimulated the byways of their memory architecture and primed their minds for retaining new material.³⁶ When we space out learning and then struggle to retrieve our newfound knowledge, we force ourselves to reflect on what we know. Spacing, a deliberate practice of digression, is a core practice of the best thinkers, and of the artisan. The craftsman does not barrel through an artwork, all in one go. (The wood must season. The clay must harden. The artisan’s vision shifts with time.) The process of creation unfolds slowly, step by step, with both necessary and intended delays.

THE WORKMANSHIP OF RISK

Half a century ago, a taciturn English woodcarver famously used these words to describe craftsmanship. Automation is a speed-driven “workmanship of certainty” with a predetermined outcome, David J. Pye wrote in 1968. Craftsmanship, in contrast, “depends on the judgment, dexterity and care” taken in the making.³⁷ The outcome is not guaranteed, the process an improvisation, just as when we reflect. A professor at the Royal College of Art and an architect by training, Pye became a leading voice of modern craft. He lived at a time when great debates raged in society about the deskilling of the hand. Today, his ideas deserve new recognition. We should be having similarly impassioned discussions about the deskilling of the mind by speed, machinery, and an unwillingness to *think slow*. In this time-splicing, limit-less world, office workers spend just five percent of their workdays thinking reflectively.³⁸ Chief executive officers spend a mere three to four percent of their work-weeks thinking.³⁹ Teachers give students on average one second to respond before turning to a new question or providing the answer themselves.⁴⁰ Are we willing to embark upon the “workmanship of risk” that is the craftsmanship of thinking? We are speeding toward an era of quick and shallow thinking, a time of epidemic attentional fragmentation.

And yet I am hopeful. We seem headed down the path of ever-increasing speed of digital media and living, of seamlessness between devices and human, of technologies made in the image of our quick minds. But if we always look at what seems clear in the moment or what is “mainstream” this minute, we will *never* see the future. That’s because clues to the future lie instead within the contradictions, inversions, and oddities percolating at the margins of change. And at the edges of digital life, we see growing uneasiness. A majority of Americans say the Internet has improved the quality of their lives, yet the same numbers say it has made us lazy and distracted.⁴¹ People flock to digital detox retreats and attempt tech-free weekends or vacations. In one national study, nearly seventy percent of middle- and high-school teachers blamed digital tools for leading students to take shortcuts and less effort in their writing.⁴² These are the inversions, the telling clues at the margins of life. Amidst this unease is not just a glimpse of the future but an opportunity. For uncertainty is the *gateway* to slow-thinking. “One can think reflectively,” wrote the philosopher John Dewey, “only when one is willing to endure suspense.” Today, we can look to the margins of digital life for inspiration and see our ambivalence with technology as a sign of a deep yearning to embrace slow thinking. Stepping back and questioning “what is” is *not* fringe. It is a deeply human effort to gain perspective.

So let us begin to cultivate the risky art of crafted thinking as a starting point to righting the imbalances in our speed- and tech-centric ways of living. Let us protect the integrity of the moment through creative boundary-making. We can unclutter our classrooms or home spaces, practice one-minute tech breaks, and limit multitasking. We can cultivate verticality in thought by practicing elaboration of an idea or observation, as I did at the museum. We can allow our minds to drift after intense learning, or cultivate the force of delay that strengthens our schemas of knowledge. These habits of mind will allow us to restore depth to thinking and keep us working alongside, not yoked to, our devices.

Just twenty minutes before my experiment ended, a tour guide shepherded a group up to the painting. One of the world’s most reproduced images, Leutze’s *Crossing* is a symbol of hope and liberation, said the guide. The painting was intended to inspire Euro-

pean rebellion against tyranny. Yet the artist deliberately chose to depict not the triumph and glory of wartime victory, he said, but the suspense of an unknown outcome. The tour moved on, leaving me alone momentarily with the vast scene of fragility and determination. Painting is a “contemplative art,” Leutze once wrote, that begins with “one clear idea, which is to be the inspiration of the picture.” And his subject, the first president, was a deliberative thinker. He was sometimes criticized for taking the utmost care with strategy, and yet that trait may have proved to be our greatest asset in war. Are we willing to stop for a minute and think? Are we willing to embrace the craftsmanship of reflection in order to change the world?

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